

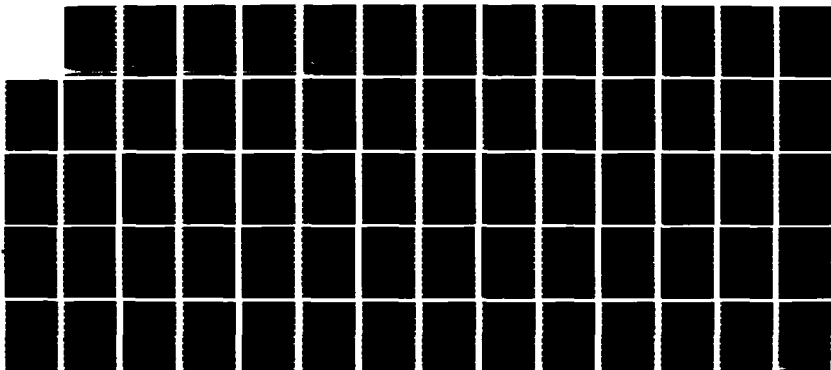
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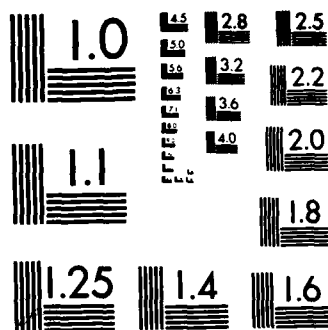
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A RAND NOTE

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POSSIBLE SOVIET RESPONSES TO THE STRATEGIC
DEFENSE INITIATIVE: A FUNCTIONALLY ORGANIZED
TAXONOMY

Kevin N. Lewis

July 1986

N-2478-AF

Prepared for

The United States Air Force

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In the wake of the Strategic Defense Initiative (SDI), much effort has been devoted to estimating potential Soviet responses to it. There is general agreement that the Soviet response will (1) consist of attempts to stop, circumvent, emulate, and neutralize the SDI; (2) include political, military, and strategic efforts; and (3) vary over time, depending on several factors. Setting aside Soviet technological options, this Note considers various factors that might interest or influence senior Soviet decisionmakers as they consider a range of programmatic, strategic, and political options for responding to the SDI. Its goal is to identify generic categories of Soviet response options rather than the specific forms those options may take.



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PREFACE

Under the National Security Strategies Program of Project AIR FORCE, The Rand Corporation is providing analytical support to the Assistant Chief of Staff/Intelligence, Hq USAF, on the question of possible Soviet responses to the U.S. Strategic Defense Initiative (SDI). This effort examines Soviet policy toward SDI in terms of those aspects of doctrine and strategy, offensive and defensive force deployments, internal resource decisions, arms control behavior, and international conduct that could have a reciprocal bearing on U.S. security. Although the work necessarily includes consideration of Soviet R&D trends pertinent to advanced defenses, it does not set out to do technological forecasting. Nor is it intended to compete with the many technical assessments already under way, both within and outside the U.S. government, of Moscow's response options. Rather, it is concerned mainly with generic political-military issues and the implications of SDI for Soviet foreign and defense policy in a broadly defined context.

This Note sets the stage for further evaluation of possible Soviet reactions to SDI by developing a taxonomy¹ of plausible response options open to the Kremlin leadership in the military-technical, "grand strategic," and political spheres. It should be of interest to USAF officers in the operations, plans, and intelligence communities concerned with SDI, U.S.-Soviet strategic interactions, the arms control process, and trends in Soviet military strategy and policy.

For their assistance in preparing this Note, the author is indebted to Rand colleagues Benjamin Lambeth, Timothy Webb, and Helen Turin.

¹The word "taxonomy" is not used here in its strict scientific sense, but rather in the sense of a systematically organized catalog (or inventory).

SUMMARY

In the wake of the President's 23 March 1983 speech calling for a national Strategic Defense Initiative (SDI), much effort has been devoted to estimating potential Soviet responses to the Initiative as a whole. There is general agreement that the Soviet response will: (1) **consist of a collection of attempts to stop, circumvent, emulate, and neutralize the SDI**; (2) include all the various **dimensions of state activity--political, military, and strategic**; and (3) **vary over time depending on several factors**.

Many of the factors involved in each of these three categories of generic response are, of course, difficult to predict in detail at the present time. In particular, analytic efforts to develop hypothetical "Soviet responses" have tended to be rather narrowly focused. Many such assessments have yielded useful results so far (and will continue to do so), but certain insights may be sacrificed in the bargain. For one thing, a unified Soviet counter-SDI program will inevitably be "cross-cutting:" many elements of the Soviet military and political establishment may be involved, and some aspects of any integrated Soviet counter-plan may be intended to affect other balances than the strategic or strategic defense one. For another, there is an understandable tendency to resort to simple laundry-listing in attempts to forecast possible Soviet endeavors. Finally, there is a tendency to mirror-image prospective Soviet responses--a technique that may ultimately prove correct, but it must now be viewed with some skepticism, if only because not every facet of an ultimate SDI program is now very predictable.

A cross-cutting taxonomy of the range of potential Soviet countermeasures to SDI is derived on the basis of many factors. The aim is to identify *generic categories* of Soviet response options, rather than the *specific forms* those options may take. In addition to some discussion of the bases for this taxonomy, the following generic responses will be considered:

I. Primarily Military or Technological Steps.

A. Destroying or rendering ineffective U.S. strategic defense by active means.

1. Interfering with or disrupting U.S. SDI deployment.
2. Preemption in lieu of U.S. deployment of ideal defenses.
3. Suppressing U.S. defenses.
4. Disrupting battle management, sensor, control, and related assets.
5. Bringing about the gradual degradation of U.S. strategic defenses.
6. Employing time-critical offensive tactics to degrade strategic defenses.
7. Disrupting U.S. SDI-related drills, training, etc.
8. Diverting "multi-capable" SDI assets away from strategic defenses.
9. Sabotage/direct attack on U.S. SDI-related industrial base/test facilities.

B. Emulation of U.S. defensive capabilities.

1. Space-based components, especially DABM satellites.
2. Defense against U.S. air-breathing threats.
3. Ground-based ABM capabilities.
4. Civil defense and internal security.
5. Anti-submarine and anti-maritime capabilities.
6. Subversive attacks on forces at bases.

C. Evasion of selected SDI components, including passive means.

1. Neutralizing ability of joint U.S. offense/SDI to wreck Soviet posture.
2. Evading space-based DABM with long-range missile forces.
3. Evading space-based DABM with alternative attack means.
4. Evading SDI as a whole by proliferating offensive forces.

D. Introducing uncertainties into U.S. strategic preparations.

1. Denying U.S. planners key USSR offensive forces parameters.
2. Surreptitious means.
3. Diversification of Soviet SOFs and counter-SDI capabilities.
4. Undertake "tests" of U.S. posture with aim of demonstrating deficiencies.
5. Periodically reveal new capabilities that undermine Western confidence in SDI's ability.
6. Introduce "crisis destabilizing" features of SDI.

E. Coping with spinoffs of U.S. SDI.

1. Denying U.S. new sorts of SDI-related advantages in theater defense.
2. Replicate/negate U.S. SDI-related naval applications.
3. Theft of U.S./Western technology.

II. Primarily Grand Strategic Steps.

- A. Negate U.S. cost-imposing/resource-diverting attempts.
 - 1. Refuse to play.
 - 2. Countervailing burden-imposing threat.
 - 3. Exploit asymmetric alternatives.
- B. Negate, by defensive deployments, U.S. extended deterrent forces.
- C. Negate, by defensive deployments, independent Western deterrents.
- D. Pose countervailing threat to U.S. Eurasian theater defense interests.
- E. Undertake steps to help achieve Soviet war goals in spite of outcome of the strategic battle.
- F. Reconfigure posture and policy to threaten dire global war outcomes.
 - 1. Spoil-sport weapons.
 - 2. Targeting for nuclear winter.

III. Primarily Political Steps.

- A. Use U.S. SDI as alliance-busting wedge.
- B. Refuse to play in a strategic defensive arms race.
- C. Use declaratory policy to highlight adverse military and strategic repercussions of U.S.-induced balance changes.
- D. Aim negotiations at limiting U.S. SDI options.
- E. Aim negotiations at U.S. offensive posture options.
- F. Exploit political asymmetries.
- G. Amplify unstable aspects of SDI competition to generate popular anxiety, opposition to deployment.
- H. Be more willing than United States to absorb pain.

ABBREVIATIONS

AAA	Anti-Aircraft Artillery
ABM	Anti-Ballistic Missile
ALCM	Air-Launched Cruise Missile
ASAT	Anti-Satellite
ASW	Anti-Submarine Warfare
ATB	Advanced Technology ("Stealth") Bomber
ATM	Anti-Tactical Missile
BMD	Ballistic Missile Defense
BUIC	Backup Interceptor Control
CG	Guided Missile Cruiser
CONUS	Continental United States
DABM	Defense Against Ballistic Missiles
EMP	Electromagnetic Pulse
FOFA	Follow-On Forces Attack
IOC	Initial Operational Capability
NCA	National Command Authorities
SICBM	Small ICBM
SIOP	Single Integrated Operational Plan
SLCM	Sea-Launched Cruise Missile
SOF	Strategic Offensive Forces
Spetznaz	Soviet Special Forces
SRF	Strategic Rocket Forces
SSGN	Cruise Missile-Launching Submarine, Nuclear-Powered
TBM	Tactical Ballistic Missile

^x
CONTENTS —

PREFACE	iii
SUMMARY	v
ABBREVIATIONS	ix
TABLES	xiii

Section

I. INTRODUCTION	1
II. PRECURSORS TO ANY TAXONOMY OF SOVIET RESPONSES TO SDI	4
Just Who Is Responding?	4
Just What Would Bother the Soviet Union About SDI?	8
Factors Contributing to SDI Viability Over Time	12
Introduction to a Catalog of Soviet Responses to SDI	16
III. CATEGORY I: PRIMARILY MILITARY OR TECHNOLOGICAL STEPS	19
Destroying or Rendering Ineffective U.S. Strategic Defenses by Active Means	19
Emulation of U.S. Defensive Capabilities	25
Evasion of selected SDI components, including passive means	30
Introducing Uncertainties into U.S. Strategic Preparations	34
Coping With Spinoffs of U.S. SDI	38
IV. CATEGORY II: PRIMARILY GRAND STRATEGIC STEPS	40
Negate U.S. Cost-Imposing/Resource-Diverting Attempts	40
Negate U.S. Extended Deterrent Forces by Defensive Deployments	43
Negate Independent Western Deterrents by Defensive Deployments	44
Pose a Countervailing Threat to U.S. Eurasian Theater Defense Interests	44
Undertake Steps to Help Assure Soviet War Goals in Spite of the Outcome of the Strategic Battle	45
Reconfigure Soviet Posture and Policy to Threaten Dire Global War Outcomes	46

V. CATEGORY III: PRIMARILY POLITICAL STEPS	47
Use SDI as an Alliance-busting Wedge	47
Refuse to Play in a Strategic Defensive Arms Race	47
Use Declaratory Policy to Highlight Adverse Military and Strategic Repercussions of U.S.-induced Balance Changes ..	47
Negotiations Aimed at Limiting U.S. SDI Options	48
Negotiations Aimed at U.S. Offensive Posture Options	49
Exploit Political Asymmetries that Call SDI Feasibility into Question	49
Amplify the Destabilizing Aspects of SDI to Generate Popular Anxiety and Opposition to Deployment	50
Be More Willing than the United States to Absorb Pain	51
VI. CONCLUDING REMARKS	52

TABLES

1.	The Catalog	17
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I. INTRODUCTION

In the wake of the President's October 1981 and March 1983 calls for research into the feasibility of and investment in advanced strategic homeland defense systems, substantial resources and effort have been devoted to the study of possible Soviet countermeasures to these steps. This work has not only reconsidered the possible future nature of a vigorous and continuing Soviet strategic defense program, it has also explored potential specific Soviet responses to the substance as well as the implications of the U.S. Strategic Defense Initiative (SDI). In the past three years, many efforts within the government and elsewhere have sought to predict certain specific *technological* responses the Kremlin might pursue to evade, emulate, or actually neutralize new deployed United States strategic defenses.

The present document follows a somewhat different tack. It does not concentrate so much on Soviet technological options¹ as it does on various other factors that might interest or influence senior Soviet decisionmakers as they consider a range of programmatic, strategic, and political options for responding to the U.S. SDI.² It is clearly difficult to develop any single framework for cataloging systematically (i.e., according to a single, consistent set of criteria, aims, or

¹In the sense of *design* options. The Note does, however, consider overall categories of technological response.

²In this Note, I have followed the by-now accepted convention of employing the abbreviation "SDI" to refer not only to the U.S. initiative in its own right, but also to the collection of systems fielded and operational concepts devised under the aegis of the umbrella initiative. Thus, "to defeat SDI" might refer either to efforts intended to undermine the President's 23 March 1983 "Initiative"--political, military, and otherwise--or, similarly, to military and technical means for neutralizing U.S. systems deployed in the wake of the announcement of the Initiative, depending on the context of the discussion in question. Also, in many cases, discussion refers to the larger U.S. homeland strategic defense problem for the sake of completeness: thus, in line with the President's other stated goals I assume the general movement toward a total U.S. comprehensive strategic defense posture. Finally, SDI is always used to refer to *U.S.*, not Soviet, efforts.

results) the net roster of all possible Soviet actions in this regard, inasmuch as the most economical approach to a catalog would include some Soviet measures that were mainly *functional*, and some sets of measures that were grouped together because of key *structural* similarities. As a consequence of this duality, there will inevitably be overlap between some catalog entries as well as certain other ambiguities.³

No effort is made to assign probabilities to any Soviet choice. Nor are any estimates hazarded regarding the relative risks posed to the United States and the West as a whole by any particular line of Soviet SDI countermeasures. Rather, taking key structural and functional factors into account, a comprehensive set of issues and choices is laid out. The taxonomy given here is developed in this way because it seems to provide a sound and logical basis for the more detailed review of salient planning and forecasting issues. The aim, in short, is to devise a useful backdrop against which subsequent analysis can be pursued.

Three generic types of Soviet response are considered:

Primarily Military or Technological Steps. These entail specific operational, technical, and tactical measures the Soviets might pursue primarily to return the military balance to a condition that might have prevailed in the absence of SDI, to consolidate some side-gain, or, conceivably, to take advantage of SDI as an "excuse" to pursue some other long-standing military goal. Such countermeasures might include the modification of Soviet missile designs to improve the penetrativity of a given type of Soviet nuclear system or the exploration of alternatives to ballistic missiles for some strategic attack roles. Here, no reconsideration of the missions of nuclear forces is at issue. The only question concerns the preservation of a given type or level of capability in the face of new U.S. defensive enterprises.

Primarily Grand Strategic Steps. This category refers generally to initiatives that acknowledge a substantive change in the overall balance and accordingly seek to adjust operational concepts, other military

³To focus only on one basis for a taxonomy would require including many low probability and highly eccentric responses, as well as several very nonstandard and unconventional response categories: hence the convenience of dual criteria.

balances, and the like so that a fairly constant or evolutionary set of political goals can be pursued. For example, SDI might hold out the mid-range or long-term prospect that nuclear forces might play a reduced role in helping the Soviets attain their comprehensive set of politico-military objectives on the world stage. Consequently, measures to compensate (particularly in some other military sphere) for the diminished importance of nuclear weapons would fall into this category.

Primarily Political Steps. These include all other steps (including some that might have been taken in any case or that are purely declaratory or propagandistic in nature) aimed at pursuing basically political goals--including those with ramifications above and beyond the effects and goals that would be furthered by primarily military steps. Regardless of SDI's military and strategic effects, it is crucial to recall that in the Soviet Union's integrated defense and foreign policy strategy, armed forces are but one means to an end. Pursuit of such traditional long-range goals as the dissolution of organized coalitional threats along Soviet frontiers might exploit SDI--and a spectrum of responses to it--as an opportunity (or, more likely, an excuse) for previously prohibited or denied actions.

Most of this Note is concerned with the elements of a taxonomy organized along the main themes of the above three categories. For each major category, an extensive list of constituent strategies or, more precisely, operational plans or techniques for achieving Soviet objectives is suggested. It will first be useful to address certain allied topics that, although not subject to analytic treatment here, should play a considerable role in determining the forms of any Soviet response to SDI and should therefore be kept in mind as the following overview catalog is presented.

II. PRECURSORS TO ANY TAXONOMY OF SOVIET RESPONSES TO SDI

JUST WHO IS RESPONDING?

Most military organizations, like their political overseers, never respond to external stimuli in any entirely predictable way. Although many accounts assume otherwise, that has not better informed meaningful strategic analysis and debate. In fact, policy choices at *all* levels result from a complex set of personal, organizational, and other important influences and interactions. To form a fairly balanced assessment, then, it is necessary to identify who will be key respondents, and to which of the many diverse aspects of the proposed SDI they are reacting.

Monitoring the U.S.-Soviet military competition, generally or in any particular subfield, elicits an understandable tendency to refer to some "Soviet response." This results from many factors, including:

- The tendency to overgeneralize from a given specific situation in order to render a certain development more meaningful to a wider circle of the "uninitiated" (for political, argumentative, or other reasons). Cases of this tendency are frequent in the popular willingness to construe the deployment of individual Soviet weapons, singular Soviet practices (e.g., apparent arms control violations), and other behavior as "evidence" to confirm some larger, usually ominous, and apparently unified Soviet intention.
- The mysterious and apparently monolithic nature of Soviet policymaking as a whole. Here the apparent centrality of doctrinal statements frequently adds little to the overall picture, insofar as the connections between doctrine and action are often opaque.
- The facts that Soviet statements are carefully coordinated and above all that there is not much obvious internal dispute over policy issues.

- The often emotional--and therefore unshakeable--preconceptions about the Soviet Union held by many in the West.
- The apparent unremitting "totality" of the U.S.-Soviet competition.
- The advantages of a common means of conveniently describing various complex matters.

In fact, if there is such a thing as a monolithic Soviet political-military entity, to paraphrase William Kaufmann, nobody has yet been able to find its phone number.¹ Various parts of the Soviet national security structure, and communities even within a particular institution, may see things quite differently indeed. Each military branch will naturally attribute great importance to its own operational and developmental problems and may be inclined to downplay the importance of developments affecting others. Like his American counterpart, a Soviet Air Force commander will be more interested in our air-to-air missile progress than in our SSN choices. Similarly, operators, logisticians, designers, and others will have different views on any given subject. Political and military authorities will not always see eye to eye. And views will, of course, change over time even within fairly homogeneous communities.

This reality suggests one of the most important and interesting political aspects of the U.S. Strategic Defense Initiative. Whether the Soviets (or selected Soviet audiences) take SDI seriously, whether the United States is making demonstrable progress in SDI technologies, and regardless of whether the Kremlin deems countermeasures to potential SDI developments feasible (and affordable), *SDI has important implications for virtually every specialized community (including leadership communities) in the Soviet political-military establishment.* An understanding of the Soviet defense bureaucracy is therefore a vitally important task, and its implications worth considering in more detail.

¹See W. W. Kaufmann's testimony in *The Military Budget and National Economic Priorities*, U.S. Congress, Joint Economic Committee, 1969.

Compare SDI with some other recent "significant" U.S. defense initiatives, such as the various "E.T."/FOFA proposals, the 600-ship Navy, strategic mobility enhancements, calls for various "horizontal escalation" schemes, and so forth. Each of these would have fascinated some parts of the Soviet military establishment, but only bored others.² For example, the Strategic Rocket Forces would probably care little about the increment in U.S. deployable fleet size from 500 to 600 ships, because in terms of numbers of launchers the only relevant threat posed to the SRF by the U.S. Navy (*Ohio*-class SSBNs carrying the Trident II SLBM) would be constant in any case. Similarly, prospective "E.T." initiatives would not be of equal concern to every branch of every general-purpose combat arm of the Soviet Army or Air Force. In short, even some of the more dramatic recent U.S. military reform and modernization proposals would not be perceived as being of interest to the Soviet military community as a whole.

Compared with such developments, then, SDI is truly something out of the ordinary. It would affect nearly every branch and every undertaking of every subcomponent of every service. Forces earmarked for major operations against the United States and its allies, as well as for other contingencies, would also be influenced by the implications of SDI for extended deterrence, escalation control, and the long-term consequences of major investment by one or both sides in SDI. Similarly, U.S. progress on SDI could reshape the present mix of Soviet development, investment, and operational budgets. Civilians would be affected as well as the military. To cite just one example, a Soviet counter-SDI effort or a Soviet scheme to duplicate SDI could divert much talent, floorspace, and money away from other R&D enterprises. And the political importance of SDI to Soviet leaders concerned with broader matters (e.g., those interested in weakening U.S. ties with our friends and allies) is self-evident.

²Such matters would only be of general bureaucratic interest to the extent that high-level decisions to respond more to one development and less to another influenced key resource allocation decisions. But if the dynamics at work in the Soviet system are analogous to those working in this country, the concern would be neither operational nor strategic (as the Soviets are inclined to define that notion).

Therefore, in building a catalog of Soviet reactions to the SDI, it would be useful to keep in mind the various institutions and personalities who might appear on some overall Soviet "response to Star Wars" roster. Such a detailed review is clearly beyond the scope of the present undertaking. Nevertheless, some monitoring of the following communities should be pursued with comprehensive intelligence "targets" in mind:

- High-level political and bureaucratic officials. These individuals will be most concerned with the political and strategic ramifications of SDI. Here, near-term and often immediate concerns and perspectives may dominate.
- Design bureaus and scientific-technical research organizations in key advanced technology areas. The Soviet scientific establishment is no less immune to internal disagreements about research priorities than is American science.³
- Parts of the military establishment directly concerned with strategic defense developments.
- Parts of the military establishment not directly involved in strategic defenses, but whose interests and budgets nonetheless stand to be directly influenced by developments that might be inspired by major strategic defensive decisions on both sides.
- Any element of the Soviet military establishment whose strategy, concept of operations, plans, or force structure depend to any extent on the perceived role of nuclear forces in deterring or participating in a general-purpose forces campaign.

³It is necessary to distinguish between *research* and *acquisition* entities. Each has a different schedule and implied planning "discount rate," and each plays a different role in internal resource allocation struggles.

JUST WHAT WOULD BOTHER THE SOVIET UNION ABOUT SDI?

No weapon, statement, doctrine, or plan exists in a void. A U.S. declaration of plans to proceed with SDI would be meaningless in the absence of demonstrated efforts to do so, and the acquisition of a certain body of technology (together with plans and concepts of operation) means little unless there are concepts and plans for its use. Similarly, strategic defensive forces cannot be isolated from strategic offensive (or, for that matter, from enemy) capabilities.

That being the case, the Soviets might have four kinds of concerns with a U.S. strategic defense capability, each depending upon interactions between SDI and other matters.

Concerns Arising from the Relationship of SDI and U.S. Offensive Forces

Particularly when SDI either is being deployed or in the event it were to prove less than effective at eliminating a major part of the Soviet threat to the United States, the Soviets might be apprehensive about the possible interactions of offensive and defensive forces. The main reason for this concern follows from the potential ability of American defenses to cope with Soviet forces surviving a U.S. first strike. This concern is dependent, of course, on a hypothetical Soviet willingness to concede the United States the first shot. The situation it envisions could include the basic ingredients of what is known as "crisis instability."

A potential--if highly unlikely--U.S. counterforce bolt from the blue would be a matter of special concern, given the possible ability of SDI to cope with surviving Soviet retaliatory forces. There would be some novel features of this threat, but it is arguable that the USSR would find itself on familiar ground to a large extent. In the early 1960s, a U.S. first strike would have decimated Soviet nuclear forces (except, perhaps, for those targeted against the European or Far Eastern theaters). What long-range forces survived would have had to have run a gauntlet of U.S. defenses including, among other things, some 2,000 interceptors and several thousand SAM and AAA installations. In essence, the United States could have wiped out the Soviets at low cost--and more important, at predictably low cost to its own homeland.

Some special cases of this general Soviet concern are worth specific attention. U.S. countersensor attacks become a graver proposition once SDI has been deployed, because the USSR would lose its ability to preempt on reliable warning of a U.S. strike and, even more, would be deprived of a space tracking capability. This anxiety would naturally be amplified if certain SDI components could function in a dual defensive-ASAT/sensor role.

U.S. defense suppression attacks would provide further assurance of good first strike performance. U.S. selective offensive employment in support of theater aims would become a more credible option if a concomitant ability to deal with Soviet limited employment were in hand. Finally, given the nature of many space-based options for SDI, the incentives for preemption by either side in a severe crisis could grow (depending largely on what leadership behavior one assumes). More than in any other military measures-countermeasures race, the cheapest way of hardening space-based components against the effects of direct attack would be by decisive offensive action at the outset of hostilities.

In sum, the Soviets might be likely to feel especially menaced if SDI were associated with no appreciable limitations on offensive potential, if the United States seemed to rely more and more on nuclear use in support of theater war aims, or if SDI did not achieve a very reliable level of defensive performance, whether by deliberate U.S. choice or otherwise. The last issue is especially noteworthy, because a "half-way" U.S. SDI could have particularly ominous implications for Soviet planners. A partial defense (unable to defend CONUS against Soviet first strikes) might have operational credibility in Soviet eyes only in conjunction with the first offensive shot. If the price of admission through a half-way defense is sufficiently prohibitive, the USSR would be unable to afford to launch less than all-out attacks. In short, a partial defense situation would put the Kremlin in a tricky position indeed.

Concerns Arising from the Relationship of SDI and Soviet Offensive Forces

Here, the Soviets could have basically five kinds of concern with the synergisms that might develop or be exploited between SDI and the assigned roles of Soviet offensive forces:

1. *U.S. defense against limited Soviet attack.* Does Soviet doctrine posit a requirement to carry out limited nuclear options either against the United States or in some peripheral theater? If so, what does SDI mean for the continued viability of this mission and the strategy that generated it?
2. *U.S. defense against a massive Soviet countermilitary attack.* Even more pressing than the foregoing item is the possibility that Soviet leadership would be concerned with the diminution of its ability to carry out a "decisive" nuclear offensive against a broad range of military targets. To determine any such Soviet concern with confidence would require more knowledge about Soviet target-coverage priorities than probably is available, but there is some basis for at least informed speculation.
3. *U.S. defense against all-out Soviet attack.* Should the Soviets ever opt for this unlikely option in a dire strait and believe that they could escape American detection of (and therefore preemptive response to) Soviet preparations for any such attack, U.S. defenses would render a Soviet first strike less effective. More important, it would make a Soviet surprise attack option less predictable in its prompt military effects, a matter of far greater consequence if decapitating and other related high-priority missions are on the Soviet offensive agenda.
4. *U.S. retaliation after a Soviet counterforce attack.* The Soviets could not reasonably expect to undercut all legs of the American offensive triad (especially sea- and bomber-based ones), no matter how well they might do against locatable strategic offensive missile forces. The value of U.S. SDI

capabilities in defending against Soviet preemption (by, for instance, breaking up saturation attacks aimed into the airspace around SAC bases or mobile ICBM garrisons) could become very important in Soviet planning.

5. *U.S. retaliation after a Soviet C3I attack.* For many reasons, and depending on defensive rules of engagement, defenses could complicate sophisticated limited Soviet first-use options.

Concerns Arising from Greatly Improved Western Theater Air and ATM Defenses

Finally, exploration of certain SDI-related technologies could have important implications for other aspects of the overall U.S.-Soviet military competition, including the general-purpose forces competition. The most apparent case in point, and the one least likely to be overlooked by Soviet analysts, would be analogous theater defense functions. Although some U.S. SDI components might not be particularly appropriate in a theater setting (e.g., certain types of space-based defenses, given the shorter time of flight and lower apogee of TBM projectiles), others might be very important in relieving current Western vulnerabilities.

Another case in point may entail ongoing Western efforts to defend against the growing Soviet tactical ballistic missile threat to such high-value land targets as air bases, nuclear weapons storage igloos, command and control sites, and the like. The same applies to the defense of Western maritime targets against cruise missiles and other weapons launched from standoff aircraft (although a follow-on ballistic threat to naval targets on the model of the failed SS-NX-13 cannot be ruled out, given known Soviet predilections).

Other technological spinoffs could be of almost equal importance. The development of computing capabilities needed for battle management against large ballistic missile raids might have applications in other military arenas, such as ASW and tactical air-to-surface targeting. This is true as well regarding many sensor technologies, such as those that try to detect, track, and vector offensive payloads to some so-called "deep" theater targets like TBMs. For these and other reasons, the Soviets would have considerable justification in fearing

new aspects of the technology base that might well be spawned as a result of an SDI concept validation effort.

FACTORS CONTRIBUTING TO SDI VIABILITY OVER TIME

To a Western observer, one of the regrettable characteristics of the U.S. defense planning process is our frequent inability to sustain particular programs over time. Programs frequently lose support and are reduced in scope or terminated altogether. Many times a program is reconfigured in such a way that the end result only remotely resembles the program's initial objectives. The more controversial a program and the longer it is intended to run, the greater may be the probabilities that original plans will go awry.

Because the SDI is both a very long term effort and a controversial one, it would not be imprudent to assume that present conceptions of a future SDI system's architecture will not be realized. No matter how much the Soviets may fear an ultimate SDI deployment, they are aware that there is a nontrivial probability that deployment will never take place. This recognition will certainly shape the Kremlin's overall response to SDI.

A framework attempting to characterize the scope of potential Soviet responses to SDI would also necessarily include potential factors the Soviets might monitor to determine whether the United States had attained a particular degree of support for SDI development or deployment. Here is yet another case in which SDI is conceptually unlike many other major U.S. defense initiatives. This is so for four reasons.

First, even fairly abrupt technological advances often only improve the U.S. capability to accomplish an existing military mission, whether this involves adding a qualitatively improved force increment, a quantitative force increment, or the acceleration of a plan to field a given "inevitable" U.S. force capability. For instance, generations of weapons and tactics have come and gone with a single purpose in mind--to shoot down or otherwise destroy the Soviet Air Force. However, SDI could potentially change the fundamental ground rules of major kinds of planning for strategic and general purpose forces alike.

Second, it may almost be a cliché by now, but U.S. technological superiority in many of the fields required for any SDI deployment undoubtedly is and will continue to be a major determinant of Soviet behavior. As much as they might view SDI skeptically, prudent Soviet planners may be far more inclined than some U.S. and European critics to take even casual SDI rhetoric seriously.

Third, many bets would have to be hedged in anything beyond a less-than-all-out SDI competition. Given that many of these could be enormously expensive, or could lead to enormously expensive systems, some kind of "triage" determinations as to what may represent the soundest approaches will inevitably be required. Such determinations will be all the more difficult since they may have to be made *before* a technological or operational concept is demonstrated.

Fourth, even if SDI falls significantly short of its original goals, the resulting truncated development could nonetheless be of great importance militarily. For instance, even if some future U.S. administration concludes that SDI is too expensive, unworkable from a command and control point of view, strategically unwise, or just too politically problematic, technologies may have been developed in the interim that will allow for major U.S. military strides of other kinds. Some examples that immediately come to mind are the perfection of SDI weapons such as high-energy lasers and their exploitation in ASAT or close-in defense roles, and greatly improved optical and data processing capabilities with many military implications.

The Soviets would find it impossible to assess such matters in all their possible ramifications, even were a full accounting of the aims, techniques, and programs subordinate to a long-range SDI to be made available for their inspection. Nevertheless, the Soviets will almost surely attempt to make some sorts of probabilistic and anticipatory "damage assessment" calculations, even before contemplating specific countermeasures. It is inevitable that the following factors will figure in any such calculations.

What are the prospects for the financial sustainability of SDI? As noted above, the history of the U.S. strategic effort, offensive and defensive alike, is replete with cases where "plans" have translated

into results bearing little if any resemblance to original intentions. Such failures do not, however, constitute comfortable grounds for Soviet complacency. Sometimes, constrained or even bungled American efforts still lead to big problems for the Soviets. For example, the U.S. Minuteman program did not follow its initial script--fewer weapons were procured and some originally planned features such as mobility were not acquired--but a serious threat to Soviet hard targets eventually appeared as a result of U.S. success in retrofitting new capabilities (accuracy, flexibility, reliability, improved silo hardness, and more) into what turned out to be a very robust baseline design. Similarly, the Soviet response to the projected B-70 program--including what was in the aggregate a very expensive weapon program (the MiG-25/SA-5)--was procured even as the B-70 aircraft died aborning.

This, of course, does not mean that the United States will succeed in this fashion on every occasion, either by luck or by design. Many times it has been *our* defense establishment that has squandered scarce resources, delayed the arrival of a needed capability to a dangerous degree, and so on. For example, had the MX missile system come on line on schedule, it might be the Soviets who would now be the more burdened party, relatively speaking, when it came to being compelled to consider more expensive and operationally constraining options such as missile mobility and ICBM defractionation. In short, the issues are complex, and much assessment will be required.

What "technological feasibility" uncertainties exist? So far, one of the main themes of the domestic U.S. debate over SDI has concerned the feasibility of a system intended to accomplish the demanding--some say impossible--aims originally articulated (and subsequently restated) by the President, namely providing an effective defense of the American civilian population. Yet even strong supporters of expanded SDI research are prone to cite the advantages of less ambitious defensive screens for many military, strategic, and political reasons. The Soviets will therefore have to consider partial U.S. aims (as well as the range of technological options available to underwrite such aims) along with the risks and probabilities attendant upon U.S. pursuit of more comprehensive defensive designs. Such considerations could enter into many aspects of the Soviet counter-SDI program. One could even

imagine a Soviet effort seeking to encourage U.S. research into nominally alarming but technically hazardous defensive concepts simply as a technique to force the depletion of U.S. political and budgetary resources in quest of a technological blind lead.

Out and out political rejection of SDI? Strategic issues in the United States, especially defensive ones, can be notoriously political. They have historically sustained major dislocations with even fairly peripheral changes in the political environment. One need only recall the fate of civil defense (at any time), the partial demise of the SALT II Treaty in December 1979, and, of course, the ongoing controversy over SDI. A Soviet planner inclined to gamble might harbor at least a guarded expectation that SDI may eventually fail politically, regardless of any technological or strategic progress, or that great program reorientations may occur.

Might there be arms control resolutions? Similarly, as with the ABM Treaty, it is possible that the SDI conundrum could be resolved at the bargaining table. A Soviet planner strapped for financial resources and burdened by bureaucratic disputes will be quite aware of this possibility and may adjust his bureaucratic behavior accordingly.

What are the costs to the Soviets of responding to SDI? Given the poor health of the Soviet economy, the apparent priorities of the Gorbachev regime, the military challenges posed by the United States in other areas, and the possibly great cost of new strategic defenses and counters to U.S. defensive projects, painful and controversial resource allocation priorities will have to be set early on.

In short, it is impossible to say what bases the Soviets might now be willing or able to cover as they consider their possible responses to SDI. However, many factors impinging on their calculus of relative likelihoods of accomplishing given things *and* on their necessarily changing beliefs about the true risks posed by SDI will inform their counter-plans.

INTRODUCTION TO A CATALOG OF SOVIET RESPONSES TO SDI

As is the case with any major national policy undertaking, military

activities (above all those connected with nuclear interactions among the two military superpowers) can not be easily classified as specific responses to specific stimuli. No military concept, program, development, or option can be separated from the political matrix in which it originates. Likewise, there can be no systematic technique for accounting for the roles played by faulty perceptions, incorrect anticipations of future developments, concealed motives, delays in action, third-party influences, erroneous implementation of decisions, pure chance, and many other factors.

However difficult crystal ball gazing may be when it comes to specific choices that might be taken during the course of a military competition, it is still necessary to bound the possible steps that might be taken by the various sides involved. A good means for doing so is to generate a comprehensive catalog of generic steps that *could* be taken by key players, and then attempt to attribute subsequently to these possible outcomes some subjective estimate of probabilities. The remainder of this Note attempts the former task.

The specific forms that Moscow's responses to SDI could take would depend critically on the exact nature of both sides' offensive and defensive deployments, to name just one important factor among many. For example, if combat forces based in national homelands were thought to enjoy some degree of sanctuary status, while forces in space or at sea did not, then either side's ability to neutralize its adversary's strategic defenses would depend centrally on the specific character of fielded forces. Similarly, Soviet responses and countermeasures to American SDI deployment would vary as a function of the scenario used for planning, the behavior of other players, and many other often unpredictable determinants. For these reasons, the following discussion addresses only generic categories of Soviet response. The reader can apply the following outline of responses to any particular defensive configuration. As noted above, three major subsections follow: (1) Primarily Military or Technological Steps; (2) Primarily Grand Strategic Steps; and (3) Primarily Political Steps.

Table One provides a synopsis of the discussion to follow.

Table 1

THE CATALOG

- I. Primarily Military or Technological Steps.
 - A. Destroying or rendering ineffective U.S. strategic defense by active means.
 - 1. Interfering with or disrupting U.S. SDI deployment.
 - 2. Preemption in lieu of U.S. deployment of ideal defenses.
 - 3. Suppressing U.S. defensive satellites and related components.
 - 4. Disrupting battle management, sensor, control and related assets.
 - 5. Bringing about the gradual degradation of U.S. strategic defenses.
 - 6. Employing time-critical offensive tactics to degrade strategic defenses.
 - 7. Disrupting U.S. SDI-related drills, training, etc.
 - 8. Diverting "multi-capable" SDI assets away from strategic defenses.
 - 9. Sabotaging/direct attacking U.S. SDI-related industrial base/test facilities.
 - B. Emulation of U.S. defensive capabilities.
 - 1. Space-based components, especially DABM satellites.
 - 2. Defense against U.S. air-breathing threats.
 - 3. Ground-based ABM capabilities.
 - 4. Civil defense and internal security.
 - 5. Anti-submarine and anti-maritime capabilities.
 - 6. Subversive attacks on forces at bases.
 - C. Evasion of selected SDI components, including passive means.
 - 1. Neutralizing ability of joint U.S. offense/SDI to wreck Soviet posture.
 - 2. Evading space-based DABM with long-range missile forces.
 - 3. Evading space-based DABM with alternative attack means.
 - 4. Evading SDI as a whole by proliferating offensive forces.
 - D. Introducing uncertainties into U.S. strategic preparations.
 - 1. Denying U.S. planners key USSR offensive forces parameters.
 - 2. Surreptitious means.
 - 3. Diversification of Soviet SOFs and counter-SDI capabilities.
 - 4. Undertaking "tests" of U.S. posture with aim of demonstrating deficiencies.
 - 5. Periodically revealing new capabilities that undermine Western confidence in SDI's ability.
 - 6. Introducing "crisis destabilizing" features of SDI.
 - E. Coping with spinoffs of U.S. SDI.
 - 1. Denying U.S. new sorts of SDI-related advantages in theater

defense.

2. Replicating/negate U.S. SDI-related naval applications.
3. Theft of U.S./Western technology.

II. Primarily Grand Strategic Steps.

- A. Negating U.S. cost-imposing/resource-diverting attempts.
 1. Refusing to play.
 2. Countervailing burden-imposing threat.
 3. Exploiting asymmetric alternatives.
- B. Negating, by defensive deployments, U.S. extended deterrent forces.
- C. Negating, by defensive deployments, independent Western deterrents.
- D. Posing countervailing threat to U.S. Eurasian theater defense interests.
- E. Undertaking steps to help assure Soviet war goals in spite of outcome of the strategic battle.
- F. Reconfiguring posture and policy to threaten dire global war outcomes.
 1. Spoil-sport weapons.
 2. Targeting for nuclear winter.

III. Primarily Political Steps.

- A. Using U.S. SDI as alliance-busting wedge.
- B. Refusing to play in a strategic defensive arms race.
- C. Using declaratory policy to highlight adverse military and strategic repercussions of U.S.-induced balance changes.
- D. Negotiations aimed at limiting U.S. SDI options.
- E. Negotiations aimed at U.S. offensive posture options.
- F. Exploiting political asymmetries.
- G. Amplifying unstable aspects of SDI competition to generate popular anxiety, opposition to deployment.
- H. Be more willing than United States to absorb pain.

III. CATEGORY I: PRIMARILY MILITARY OR TECHNOLOGICAL STEPS

The Soviets might pursue military, technical, tactical, and other operational means to: (1) negate the ability of a U.S. SDI system to accomplish its goals, (2) circumvent a successful U.S. SDI, and (3) attempt to restore the pre-SDI balance by duplicating our defensive capabilities.

DESTROYING OR RENDERING INEFFECTIVE U.S. STRATEGIC DEFENSES BY ACTIVE MEANS

To accomplish this straightforward goal, the Soviets might attempt the following:

Interfering with or Disrupting U.S. SDI Deployment

The most obvious and important Soviet countermeasure to a broad U.S. strategic defense program would be an attempt to prevent full deployment of the system. An SDI network along the lines suggested in the President's 23 March 1983 speech would presumably be able to defend itself to a great degree. Accordingly, many concerns expressed to date in the Western debate on the subject of strategic defense have concentrated on the difficult "transition period" in which a defense could still have major gaps (particularly in the self-defense role). Even the most optimistic estimates of ultimate SDI performance acknowledge that the deployment of an SDI would take substantial time and would involve the sequential fielding not only of different defense layers, but also perhaps of different defense generations.

Assaults on partially deployed defenses--by many means, traditional as well as exotic--could be included in a Soviet preventive campaign, as might attacks on U.S. space-launch facilities. Inasmuch as early U.S. SDI deployments might be partially experimental in nature, it might suffice for the Soviets to confound U.S. ability to determine system effectiveness.

Because the deployment and control infrastructure for a major SDI system could be very large and technologically complex (to say nothing of expensive), direct attacks on key facilities could be launched well into an SDI acquisition phase, leaving the United States with little to show for a substantial investment. Soviet action might also cause considerable collateral damage to other U.S. space enterprises or command and control capabilities.

A model for this kind of action might be the successful Israeli attack on the Iraqi Ossirak nuclear reactor core. Given the inherent fragility of space operations (at least at the present time), successful Soviet attacks might not cross what are now considered to be critical escalation thresholds. Special-forces attacks on antennas, radars, propellant facilities, assembly areas, and the like could inflict devastating damage and might be difficult to reciprocate in kind. Although an overt attack of this sort would be extremely provocative, clandestine measures, even if identifiable by the U.S. government, might not be sufficiently apparent to domestic audiences to serve as rationales for decisive reprisals.

Preemption Against Impending U.S. Deployment of Ideal Defenses

A special case of the foregoing option would be Soviet action should the United States seem to be on the brink of achieving highly effective defenses without a condition of mutual invulnerability. This is highly improbable given the far preferable strategy of dealing with defenses in advance and the inevitable delays that either side would encounter en route to a very good defense. Nevertheless, it might be noted in passing that in Japanese deliberations to attack the United States at Pearl Harbor, those arguing for preemptive action pointed out that the superior U.S. industrial base would ultimately make military defeat of the United States impossible and that action as soon as possible was the only conceivable path to victory.¹ However, it is hard to imagine decisive nuclear action even if the Soviets had substantial enough strategic defense to mop up any U.S. retaliation.

¹In short, neither the "hawks" nor the "doves" could make a decisive case either way, so a compromise third party--advocating what in retrospect seems almost to be the magic solution of a psychologically decisive preemptive military option--was allowed to prevail to resolve difficult policy questions.

Suppressing (Directly) U.S. Defensive Weapon Satellites and Related Components

However advanced a U.S. SDI program might be in its deployment, the Soviets might choose to suppress some defenses, much in the way that Soviet air defenses would be suppressed today to allow penetration of SAC bombers and cruise missiles. Suppression could take many forms depending on the timing of suppression attacks relative to offensive nuclear use, the nature of offenses and defenses, and related operational factors. It is useful to distinguish suppression (1) before an attack by Soviet strategic offensive forces (SOFs), (2) during a Soviet SOF attack, and (3) should the United States launch an offensive strike first.

Much would depend on the nature of the U.S. defenses being suppressed. If an orbiting SDI constellation consisted of satellites with limited weapons loads, suppression tactics could be different than they might be against satellites whose armament payloads might be irreplaceably expended at some point. Similarly, depending on Soviet attack aims and requirements, suppression strikes could follow different lines. If there was no urgent need for simultaneous attacks on many U.S. targets, the Soviets might be able to poke holes in at least one echelon of a U.S. defensive constellation and perhaps exploit those as launch windows appeared from time to time.² The progress of other operations aimed against C3, the U.S. NCA, and so on would also figure in Soviet tactical planning. Finally, the progress of anti-airbreathing defense forces would be an important tactical consideration.

²Thus, satellites in a space-based SDI constellation would be "on duty" above Soviet ballistic missile launch sites on land or at sea only for a short while. Throughout the rest of their orbits, they would be less able to contribute to the main task of defending against a major missile attacks. Were it to prove possible to disable a part of an overhead DABM constellation, then the Soviets would have at least the *option* of waiting until that part of a network (if unreconstituted) reappeared overhead, launching strikes in small packages through this gap in defensive coverage.

Disrupting Battle Management, Sensor, Control and Related Assets

One very important feature of any deployed SDI--and especially one with space-based components--is the requirement that the system as a whole be able to respond to threats very quickly. This fact follows from the need to deal with missiles (whose alert status can be concealed) with short burn and flight times, as well as with early MIRV or countermeasure deployment. The possible use of nuclear explosives in some SDI components, the instantaneous attack potential of directed energy weapons and some kinds of electronic threats, and some space-based DABM satellites' inherent ASAT potential imposes unprecedented stresses on command and control and all associated force management, warning, sensor, and other systems. Although less conducive to automatic escalation than would be the case with offensive forces, some commentators have noted that predelegation--even of nuclear-armed systems--might be essential.³ In any case, there may be a major requirement for immediate and decisive action involving some substantial degree of human intervention.

That being the case, interference with the "nervous system" of a deployed SDI system could degrade or even incapacitate key defense components. Increasing the number of layers of a defense and hardening key control and other facilities will make a disrupter's job more difficult, but complete solutions will be very expensive and perhaps politically or militarily undesirable if they exist at all. Many such attacks will be fairly "conventional," in the sense that they might be used in an SDI-less world to disrupt control of offensive forces. That is to say, they might be rather alarming features of a preemptive offensive posture in a defense-free environment.

Typical measures would include destruction of ground terminals, decapitation attacks on (or assassination of) an NCA, and EMP attack. But some novel threats might be conceived to exploit unique features of an SDI component, particularly a space-based one.

³There have been allegations in the media from time to time that the only predelegation of nuclear-armed U.S. systems from the NCA to a combat CINC has taken place in the realm of strategic air defenses.

Bringing About the Gradual Degradation of U.S. Strategic Defenses (by active means)

Cost, reliability, personnel, and many other factors often combine to rule out the maintenance of very high levels of combat effectiveness for extended periods of time. In some cases, such as the U.S. Minuteman force, parts of a military posture can be kept indefinitely at a high degree of peacetime readiness. At the other end of the spectrum are bombers and, even more so, some kinds of civil defense. Readiness in these areas is maintained only at enormous cost. Even then, one would expect relative effectiveness to decay over time, regardless of how much was invested. Some elements of a U.S. SDI might degrade (predictably or otherwise) as a matter of course over time (e.g., satellites could use up fuel supplies needed for orbital station-keeping); some would degrade under conditions of great readiness (e.g., there may be areas where combat crew fatigue might become a significant factor); and in some cases, degradation might be brought about by means short of direct attack (e.g., repeated spoofing of some defenses may exhaust their combat capability).

A historical analog reflecting possible fears over this kind of spoofing can be found in the anxieties of many operational planners in the July 1914 crises. At that time, it was feared that mobilization occurring too quickly, occurring partially, or requiring an intervening standdown prior to a commitment to full-scale operations might fatally hamstring the chances for the subsequent execution of a full-scale, coordinated offensive campaign--one that necessarily had been drawn up in peacetime.

Employing Time-Critical Offensive Tactics to Degrade Strategic Defenses

Many kinds of combat capability gain or lose in effectiveness at well-characterizable points during mobilization or increased alert levels. Careful manipulation of events might help to create transient periods of vulnerability that can be exploited in any number of ways. A case in point might be simulated attacks that bring about the launching of a fleet of aircraft. If all planes are launched at once and are then

not committed, recovery and reconstitution become a problem for the launcher--and a tactical opportunity to be exploited by the enemy as conditions permit. To defeat a ground-launched space defense in this way, in selected circumstances, attacks might be launched in parcels small enough to force the defender to squander many "potential kills." Defenses that relied on early commitment of one-time deployment of weapons or on technological principles that required early commitment decisions could be vulnerable to such an operational practice. Falling also under this category might be attacks that exploited natural phenomena to an attacker's advantage. Attacks during periods of heavy cloud cover could, for instance, defeat some ground-based laser components of certain space-based mirror defenses.

Disrupting/Harassing U.S. SDI-Related Exercises and Training

Obviously, a real emergency involving full-up employment of strategic defenses would demand a very high level of performance. Similarly, it would be difficult for many reasons to simulate the kinds of major Soviet attacks that might severely tax an SDI system (particularly a space-based DABM constellation). And, for many reasons, it may be considered highly desirable *not* to reveal some critical aspects of one's SDI system, lest valuable capabilities be neutralized or emulated by the enemy. Thus SDI poses a potentially difficult test, evaluation, and training problem. The Soviets could attempt to influence the course of U.S. SDI testing, training, and other system shakedown and introduction efforts in ways that might not work to the West's advantage.

Diverting Multi-Capable SDI Assets away from Strategic Defenses

Although many SDI-related systems could be purely devoted to active or passive defense against intercontinental attack, others might have dual functions. For example, data relay satellites might play a role in supporting terrestrial communications, and interceptor aircraft could be reassigned from homeland defense to forward theater defense missions. Similarly, many components of the total U.S. military posture that could be pressed into duty on the side of conventional or strategic homeland defense functions, as the case might be, could be siphoned into the

former. For instance, attack submarines that might defend against SSGNs equipped with SLCMs intended for precursor attacks, or air-defense missile cruisers that *might* be pulled back to guard U.S. coastal targets, could be induced to deploy forward to participate in a conventional battle. Given the natural inclination of U.S. planners to attempt to prevent nuclear hostilities by containing (if not controlling) a conventional conflict, this might bring to mind prudent Soviet tactics. (One would expect to see considerable debate among Soviet planners over the likelihoods of various contingencies and their priorities, a debate analogous to one that would undoubtedly take place in the West.) The net effect of such "virtual attrition" strategies could be a degraded U.S. comprehensive strategic defensive performance.

Sabotage or Direct Attack on U.S. SDI-Related Industrial Base or Test Facilities

This subcategory is basically self-explanatory. The serial production of many sophisticated and costly space vehicles has never been attempted. It is therefore difficult to say now whether some kind of "assembly line" for SDI components could be opened or whether all systems would have to be hand-made. Nonetheless, the delicacy of the production base, the need for extraordinary quality control measures, the unlikely duplication of pertinent industrial capabilities, and so on all could render the U.S. SDI production infrastructure both a fragile and a lucrative target.

EMULATION OF U.S. DEFENSIVE CAPABILITIES

The Soviets have invested tremendous energy and resources in their strategic defenses. Where they have apparently been restrained or unwilling to pursue some line of defensive research or deployment, they have often been so disinclined out of fear of the consequences of a technological arms race in defensive systems with the United States that they could not win.

This is said to be one of the explanations for Soviet acquiescence in the ABM Treaty. Moreover, proponents of SDI have cited the Kremlin's fear of an advanced defense race as a useful form of strategic leverage--a view that takes on added credence in light of the USSR's recent

insistence, in Geneva and elsewhere, that SDI must be terminated as the price for other forms of arms control. Whatever the case, once a full-scale U.S. SDI program begins to show definite signs of progress, especially toward production and deployment decisions, the Soviet Union will presumably feel uninhibited by previous strategic defensive curbs and will proceed along whatever avenues may be available to them, just as they have done in other defensive areas--barred only by technological, resource, bureaucratic, and external image concerns. An exception to this prospect would be the scenario in which a highly cooperative joint SDI deployment effort were to be forged, which is so unlikely as to be unworthy of more than mention.

Consider the elements of a Soviet defensive program case by case:

Space-Based Components, Especially DABM Satellites

Soviet interest in the military possibilities of space and Moscow's presumed determination to match any U.S. use of space for expanded strategic defensive purposes are probably sufficient grounds to justify Soviet efforts to acquire a major space-based defensive system. However, the forms any such Soviet system might take could be quite unlike those of its American counterpart for several reasons. First, space-based defenses would be at the cutting edge of the competition where U.S. technological and quality-control superiority would really be most evident. One might accordingly expect a Soviet DABM program to have more of a manned component than would ours.

Second, the nature of U.S. and Soviet ballistic missile threats to one another would probably not be symmetrical. On the one hand, the U.S. ICBM force is not as fractionated as that of the SRF, and the possible acquisition of SICBM could further reduce the importance to the Soviets of being able to kill American ICBM boosters early in their flights. On the other hand, the U.S. SLBM threat is highly MIRVed. With the advent of Trident II, this threat will have ICBM-like accuracy and range, although the threat will appear from perhaps 20 deployed missile "fields" in diverse locations, as opposed to a few ICBM farms located fairly near one another on land. Furthermore, certain inflexibilities of SSBN operations play to the defender's advantage in some ways. For instance, SLBMs could not be fired all at once and so

would be less able to saturate defenses than ICBMs; thus, SLBM growth potential in response to a defensive threat might be limited.⁴

Defense Against U.S. Air-Breathing Threats⁵

Obviously the priority accorded to air-breathers by the United States requires relatively more Soviet attention to this threat, as is reflected by their great investment in strategic air defense fighters, surface-to-air missiles, and air battle control systems. Inevitably, the appearance of new B-1Bs, ATBs, and advanced cruise and ballistic missiles (many with greatly reduced signatures) will complicate the problem facing the Soviets. Despite the ever-changing nature of the bomber-defender competition, the Soviets have adhered to (and gradually updated when necessary) traditional concepts for defense against bombers. For instance, there has been no parallel in Soviet experience to the U.S. decision to take its control network to the air in any appreciable degree.⁶

Similarly, Soviet air defenders have not swayed from their time-honored practices of fielding as many air defense "echelons" as they can, nor have they abandoned fairly close control of defender forces

⁴Unless the U.S. offensive posture changes radically in the next 20-30 years, the Soviets would presumably pursue a kinetic-energy type of space defense system. Existence of DABM satellites on both sides also adversely influences SSBN operations in other ways. Because a necessary corollary to DABM would be a full range of capabilities for immediately tracking missile plumes with a high degree of accuracy, the problem of partially "unloading" an SSBN would be aggravated.

⁵Obviously, this is a function to which the Soviets have devoted themselves assiduously over the years; thus, their future actions will reflect modifications of an existing effort, not strictly speaking an emulation of some new American effort. The category is included here for completeness.

⁶Compared with its PVO counterpart, the American SAGE/BUIC system was a fairly low-level undertaking and has been dismantled. However, all publicly available evidence suggests that the Soviet Il-76-based air defense system known as MAINSTAY is nowhere near as capable as either of the two front-line American AWACS aircraft, the E-3A SENTRY or E-2C HAWKEYE. Indeed, the MAINSTAY has been said by some to be more analogous to the EC-121 early warning (and limited airborne control) system than it is even to a second-generation U.S. AWACS system.

even as new technologies have given those forces greatly expanded defensive reach. The main technical changes in the threat facing Soviet air defenses for the remainder of the century will be (1) reduced signature, (2) the increasing penetrativity and standoff range posed by missile carrying aircraft, and (3) increasingly deadly defense suppression capabilities. The first development would effectively reduce engagement ranges and make close-in defenses a greater priority. Because of their duty cycle and lack of dead zones, the use of air defense lasers would presumably be a clear Soviet interest. Because of the standoff threat,⁷ echelonment of air defenses to the maximum extent possible by very long-range interceptors and SAMs (and, where possible, by naval air defense capabilities) could be another major Soviet aim. Finally, dispersal of high-value interceptors, devolution of some command and control functions, and increased fighter on-board capability might come to be stressed, perhaps at the expense of more in the way of airborne interceptor controllers. The technological picture may be greatly complicated by stealth and other developments, but it is unclear if these challenges will inspire a substantially "new" Soviet air defense effort (e.g., space-based counter-bomber capabilities). The odds are that the Soviets will respond to the U.S. airbreathing threat in an evolutionary, not radical or precipitous, manner.

Ground-Based ABM Capabilities⁸

Unlike the United States, which decommissioned its Mickelson BMD complex shortly after it attained IOC, the Soviets have maintained their Moscow system and have worked to improve it incrementally over time.⁹

⁷A basic Soviet objective is to reduce the range of U.S. manned aircraft, penetrator and nonpenetrator alike. In this regard, it is worth recalling that external loading of ALCMs will increase, not decrease, the refueling requirements of U.S. standoff missile carriers. (Incidentally, should B-52s retired from SIOP roles be used for carrying theater and maritime oriented standoff missiles, there could be related theater conflict implications to this development as well). Another way of cutting into range (and hence target coverage, tactical flexibility, survivability under some circumstances, and recovery options) would be to force bombers of all types to fly at low altitudes earlier in their flight plans.

⁸The point raised in footnote 6 above applies equally here.

⁹This fact, of course, has more to do with the threat posed to the USSR by third parties--Britain, France, and China--than it does with any uniquely American threat. See Kevin N. Lewis, *Ballistic Missile*

Given this background, the probable Soviet inability to match the United States at the technological "high end" of the defensive deployment game and the general priority placed by the USSR on land-based defensive missiles, it is not unreasonable to assume that a ground-based ABM capability could be a major cog in an unconstrained Soviet strategic defensive scheme. Of course, to overcome certain ground-based BMD deficiencies (particularly vulnerability to suppression), Soviet designers would have to explore several complex and expensive countermeasures, notably proliferation of missiles and, to the extent possible, mobility and redundancy of ground-based radar components. One might reasonably expect that the USSR would deploy an expanded stop-gap ground-based ABM prior to the deployment of a space-based one, as opposed to deploying these more or less simultaneously (as the United States might do). The likelihood of this prospect is enhanced by the Soviet Union's practice to date of improving its defenses of all types in an incremental, building-block fashion.

Civil Defense and Internal Security¹⁰

A major asymmetry favoring any Soviet ability to put a comprehensive strategic defense system into place is the lack of domestic political impediments to rather drastic civil defense and internal security measures. A general effort, possibly one above and beyond Moscow's current large-scale CD effort, might be pursued as a

Defense, ICBM Modernization, and Small Strategic Attacks: Out of the Frying Pan? The Rand Corporation, P-6902, March 1983, for a pertinent discussion. The United States has, by virtue of its Pershing II deployment, added a qualitatively new threat to the Soviet NCA. However, the current Soviet decision to proceed with the modernization of its Moscow ABM system probably precedes the emergence of this threat and, in any case, is probably ineffective in the face of the very short time of flight and exceptional accuracy of Pershing. See K. N. Lewis, "Intermediate-Range Nuclear Forces," *Scientific American*, December 1980, for a brief background discussion.

¹⁰Again, this is a function to which the Soviets have devoted themselves assiduously over the years; thus, their future actions will reflect modifications of an existing effort, not strictly speaking an emulation of some new American effort. The category is included here for completeness.

"countervailing" capability to some high-technology U.S. strategic defensive element. Such a capability would have, among other things, the advantages of being both labor-intensive and fairly inexpensive, as well as of being able to draw upon a substantial civil defense and internal security infrastructure.

Anti-Submarine and Anti-Maritime Capabilities

Again, Soviet emulative/responsive efforts in this area demonstrate great asymmetries as a result of geographic disadvantages and U.S. technological superiority in some key areas. For the foreseeable future at least, the Soviet open-ocean ASW capability cannot be expected to pose a threat to U.S. SSBNs at an acceptable price. Soviet surface ships can pose a missile threat to the United States, but our ability to neutralize these threats is quite great. As far as passive defense of Soviet SSBNs goes, the USSR presumably is pursuing a bastion strategy, possibly involving under-ice operations and land- and submarine-based active supporting defenses.

Subversive Attacks on Forces at Bases

The ultimate "nth defensive echelon" would be attacks on weapons before they had left port, scrambled from U.S. air bases, and so on. Thus we should not rule out such special-purpose threats to U.S. offensive forces as *desant* commandos, emplacement of minefields, and other countermeasures involving clandestine insertion of Soviet forces. The Soviets have possibly inherent superiority in this regard, primarily because of the openness and resultant vulnerability of many important U.S. areas.

EVASION OF SELECTED SDI COMPONENTS, INCLUDING PASSIVE MEANS Neutralizing the Ability of a Joint U.S. Offense/SDI Posture to Destroy the Soviet Strategic Posture

An offensive posture capable of a so-called "splendid" first strike against Soviet retaliatory forces (or, for that matter, American ones) is an unlikely proposition, given the diversity of forces and delivery systems in a modern arsenal. However, the combination of a powerful offense and a defense capable of absorbing what would probably be an

uncoordinated and ragged retaliatory attempt might appear sufficiently formidable that the USSR would be self-deterred from responding to a U.S. first strike, largely because of the wide disparity of damage that would result from a subsequent, more punitive exchange. That being the case, a defense that was not leak-proof and also fairly ineffective against a Soviet first strike would provide powerful leverage for the United States in a crisis. A historical antecedent for this state of affairs might be found in the strategic balance between roughly 1962 and 1964. There would obviously be powerful constraints on the United States even if such a situation could be attained,¹¹ but the Soviet Union would nonetheless have to view this situation with considerable alarm. The Soviets might seek to escape from such a situation in several ways, including:

- Concealment of the location, number, and type of offensive forces (again, a kind of evasive measure in which the Soviets would enjoy a formidable intrinsic advantage because of the natures of American and Soviet societies).
- Other passive defense measures intended to enhance the offensive force's ability to ride out an attack (e.g., superhardening, mobility, concealment) *and* to assure that those instruments of conflict would be able to participate usefully in a subsequent campaign.
- Active defense of Soviet offensive forces to permit ride out or to deter U.S. preemption.
- Preemptive attack against U.S. offenses or defenses, particularly as the latter are being deployed.
- The adoption of a launch-on-warning doctrine.

¹¹The reasons for the apparent lack of utility--in American eyes, of course--of this capability are basically threefold: (1) the United States is not morally or otherwise inclined to go first, (2) even a modest and ragged Soviet retaliation would be unacceptable, and (3) any strategic principle attempting to exploit this advantage would lead to highly unacceptable alliance repercussions.

These countermeasures would be viewed by many as destabilizing. For that reason, they might presumably lead to U.S. measures to neutralize such Soviet responses in advance.

Evading Space-Based DABM with Long-range Missile Forces

A very plausible Soviet response to a U.S. space-based defensive capability would be a comprehensive program to neutralize the effectiveness of intact defenses through a combination of such measures as ICBM hardening; the use of decoys, chaff, and aerosols; the rotation of boosters during their climb-out phase; increasing the reflectivity of boosters; fast booster burn; depressed trajectories; fractional orbits; the defractionation of missile forces; and many others.

There are, moreover, conceivable tactical and operational ploys that might reduce the effectiveness of U.S. defenses. For instance, the timing of a Soviet attack might be arranged to overload a particular layer of a U.S. comprehensive strategic defense. Some of these measures would impose substantial costs on the Soviets or compel them to sacrifice some margin of military capability in other areas in the interest of evading U.S. missile defenses. Yet at the same time, some of these Soviet responses to SDI could make life much harder on us. For instance, if the price of punching through an SDI system were sufficiently high (given the number of available Soviet warheads and the Kremlin's targeting objectives), the Soviets might be compelled to resort to one large attack instead of two or more smaller ones. The net effect, of course, could be the compression of a nuclear war. This could mean the loss of any possibility that such a war, having remained limited up to a certain point, might be terminated short of all-out disaster.

Evading Space-Based DABM with Alternative Attack Means

The Soviets could also attempt to liquidate the effect of a U.S. SDI deployment by adopting alternative delivery concepts that were not vulnerable to the boost-phase intercept defense now envisioned. Indeed, they might seek to acquire such forces in any case.¹² These might

¹²As evidenced by their considerable effort in single-RV mobile

include the positioning of missiles closer to the United States (at sea or in Cuba) to minimize or eliminate their need to transit space during their trajectory; the use of airbreathing penetrators (both bombers and cruise missiles launched from land, sea, or air); the insertion of bombs by surreptitious means or by commando teams; and other options.

In effect, what a unilateral U.S. SDI does is to turn the clock back on the nuclear arms competition. How far back one wants to go is the only question. Thus a baseline space-based boost-phase intercept system might ultimately drive the USSR to defractionate its ICBMs, effectively turning the strategic clock back to the late 1960s. A more effective SDI system would drive the Soviets back to the late 1950s, when they relied on shorter-range missiles and bombers. Ultimately, an ideal SDI would nearly reverse the course of recent history and land us back in the late 1950s, when the USSR posed no nuclear ballistic missile threat to the United States. It remains to be seen how much the Soviets will attempt to hedge against SDI in this way. Even after the fact, we will only be able to guess at the increment of additional ICBM forces that the Soviets might have procured specifically as a hedge against SDI.

Evading SDI as a Whole by Proliferating Offensive Forces

The Soviets do not always select the most elegant solution when confronted with a particular military problem. As a matter of inclination, not to mention their technological, financial, and other shortcomings, the Soviets often resort to brute force to contend with Western challenges. For example, unable to match Western air forces in quality, they have opted for quantity and an air operational concept that deliberately sacrifices aircraft in order to get a certain number of weapons onto NATO targets. There is no reason to suppose they would not do exactly the same thing in the strategic arena if they feared SDI

ICBMs, new sea-based ballistic missiles, the BLACKJACK bomber, and both air- and sea-based cruise missiles, the Soviets are moving in this direction in any case. Moreover, as of this writing, there was some chance that the USSR would ultimately accede to restrictions on the relative number of weapons that could be represented in any one leg of either sides' strategic triad, although this premise was not a feature of Gorbachev's deep-cuts proposal early in 1985.

enough. Thus if the defense seemed able to exact a certain cost, the Soviets might very well simply buy that many more weapons.

Soviet attempts to overwhelm SDI in this manner could lead to a very dynamic and costly deployment competition. Perhaps imposing such costs on the Soviets would be a worthwhile side objective of SDI in that it would put great pressure on the Kremlin, divert money and other resources away from more threatening undertakings, and so on. However, the situation may not work out so well with the cost-exchange ratio tilting away from our advantage, with uncertainties growing steadily, etc. For this reason, the United States should begin contemplating a variety of strategies now for seeking Soviet "cooperation" in the matter of numbers of weapons. Such cooperation is, in my view, not very likely to be forthcoming, but certain tacit restraints are possible.

Similarly, if the Soviets could be made to fear some particular SDI program enough, they might be compelled to participate in an arms limitation scheme involving a mutual build-down of offensive forces.

INTRODUCING UNCERTAINTIES INTO U.S. STRATEGIC PREPARATIONS

One of the cases frequently made in support of SDI concerns the uncertainty that would be imposed on any Soviet planner contemplating hostile action. This argument holds that even in the face of a fairly incompetent SDI, Soviet planners would have to assume a broader range of possible outcomes--including worse-than-expected outcomes--and that this might enhance deterrence in a crisis.¹³ However, the Soviets might seek to complicate or frustrate U.S. planning for homeland defense by turning the tables and attempting to impose uncertainty on us in several ways.

The most important circumstance in which Soviet deceptive measures might figure, of course, is if an SDI were configured to mop up a ragged Soviet retaliation in the aftermath of a U.S. counterforce first strike.

¹³Not often mentioned is that the logical response to defenses of unknown quality is to assume the worst and increase the size of a proposed attack. Arguably, Moscow is going to suffer worse damage than it might otherwise have sustained on account of the presence of an ABM system of dubious quality. The only kind of attack that might be ruled out in the face of poor defenses is a highly constrained limited nuclear option, because adding weapons to an attack package might run up against option size top-line planning constraints.

Here, even if U.S. defenses were able to overcome any deceptive endeavors the Soviets might attempt, our inability to target an adequate number of Soviet launchers in the first place might deter any resort to action in a crisis.

Denying U.S. Planners Access to Key Soviet Offensive Force Parameters

Some proposed SDI technological possibilities are fairly robust in the face of potential Soviet measures to deny the United States important planning data. For instance, a space-based anti-boost-phase satellite constellation necessarily has something approaching global defense coverage, and so moving weapons away from known locations might not buy the Soviets much. (The converse of this is that most of the constellation might not play during a large-scale contingency. This is a price one might have to pay for comprehensive space-based earth coverage.) However, terminal defenses with a particular geographic orientation (such as a site located on the northern side of a target) might be susceptible to a larger variety of deceptive measures. In any case, should the Soviets desire to foil SDI by deceptive means, they could attempt to deny us information on the number, location, and attributes of their offensive forces. Although several counter-deception steps would exist, such a scheme could force the United States into greater expenditures for a given level of defensive capability, largely because a shortage of critical data would oblige us to assume the worst when it came to estimates of Soviet capabilities. Of course, an ancillary method of causing us problems in this regard would be to destroy our intelligence collection means. Judging from their previous behavior and apparent doctrine, the Soviets might be quite likely to attempt various uncertainty-imposing techniques.

Surreptitious Means

One way for Moscow to increase the complexity of our SDI planning problem greatly would be to actively subvert the SDI system itself. They could seek to acquire a special-operations capability against terrestrial SDI nodes, using prepositioned or infiltrated forces or weapons to attack data links, radars, ground-based defenses, command and

control facilities, and the like. They might also attempt the covert insertion of space mines and other ASAT weapons into the midst of a space-based SDI constellation. As noted elsewhere, the Soviets could revert to nuclear weapons clandestinely introduced into the United States--so-called "diplomatic bombs." Given the asymmetry in the two sides' views about civil rights and internal security, the Soviets would have a substantial advantage when it came to defending against this particular kind of threat.

An additional factor contributing to the importance of this particular Soviet countermeasure is the potential disconnection between official and public knowledge about the state of play in such an operation. It is possible to conceive of a covert conflict of which only the American government--but not American or Western public audiences--would be aware. Given widespread anxieties over even the notion of "strategic escalation," the Soviets might count on deliberate U.S. governmental withholding of information about strategic "interactions" that were not publicly apparent, including events occurring under water, in space, in Arctic regions, and so forth.

Diversification of Soviet SOFs and Counter-SDI Capabilities

This category of response is probably a Soviet option of choice in response to *any* combination of U.S. strategic defensive programs. Naturally, the more components to a given Soviet posture, the more uncertainty about the potential synergisms that might be exploitable in attack planning. As a result, the costs of SDI could be forced upward at an unacceptable rate. The countermeasure available to the defender, however, would be to attempt to deal with such complicating threats by offensive means wherever prudent and possible. Generating spurious lines of defense or counter-defense with which the United States would have to contend might be another type of Soviet response.

Undertake Tests of the U.S. Posture with the Aim of Demonstrating Deficiencies

The Soviets could contrive, by an actual challenge or by a staged event, to demonstrate the inadequate nature of an SDI system. Should elements of an SDI concept be tested and found wanting, that would

undermine domestic and allied confidence in SDI, force the United States into additional expenditures to deal with a perceived defensive deficiency, oblige us to abandon any assumptions we might have held when we first planned for possible offense/defense interactions, cope with a public opinion backlash, etc. Note that our *own* tests of the system might reveal major flaws, a possibility that should be kept in mind during our R&D phase.¹⁴ This is, of course, a dicey game for the Soviets to play, for if our system were shown to be capable of dealing with Soviet probes, the shoe would then be on the other foot.

Periodically Reveal New Capabilities that Undermine Western Confidence in SDI's Ability

The revelation of previously covert capabilities might create anxiety among Western planners, who would then wonder what else was out there. Because the lead times involved in putting some SDI components on line might be very lengthy (compared with the time needed to put together a "new" threat), dealing with this sort of behavior could be quite frustrating.¹⁵

Introduce Crisis Destabilizing Features of SDI

So far, much of the debate over SDI has addressed the destabilizing nature of some potential SDI components. This is a result both of the concern over (and uncertainties about) SDI, and a several-year-old resurgence in the national defense debate over a cluster of issues, including accidental or inadvertent war, confidence-building measures, and the like. In particular, space-based systems--including those that incorporate nuclear charges or once launched are "unrecallable"--might have to be put to work on very short notice, possibly even within a few

¹⁴Recall various tests proposed in the 1960s and early 1970s (among them the Giant Patriot program, subsequently canceled) in which configured Minuteman missiles were to be launched from operational silos. Some tests failed and revealed problems. Clearly there comes a time in any design and deployment program when one might not want to ask the question lest one be too deflated by the answer.

¹⁵See Kevin N. Lewis, *How Can Covert Military Capabilities Be Used To Enhance Deterrence?* The Rand Corporation, P-7225, January 1986, for a lengthier discussion and examples.

minutes after the beginning of a Soviet attack. Through propaganda or actual tests, the Soviets could manipulate corresponding Western concerns. Given the greater significance of domestic opinion to U.S. national security planners, not to mention the omnipresent dread in Western circles about accidental war, missile rattling may pay tangible dividends for the Soviets. Again, however, overdoing the threat-mongering might simply sell more Americans on the need for a comprehensive strategic defense.

COPING WITH SPINOFFS OF U.S. SDI

The Soviets are certainly aware that several SDI-related technologies have applications in contexts other than a central strategic defensive campaign. Thus, a Soviet response to SDI could include other elements of the wider U.S.-USSR military competition. These responses could take several forms.

Denying the United States New Sorts of SDI-Related Advantages in Theater Defense

The capability to defend against intercontinental threats has obvious theater-conflict contingency applications--for traditional air defense and, probably much more important in the long run, for anti-tactical ballistic missile (ATBM) defense.

Replicate or Negate U.S. SDI-Related Naval Applications

The U.S. Navy faces a daunting task when it contemplates the problem of defending its carrier battle groups against a very diverse and increasingly capable missile threat. Lasers for terminal defense would be an especially valuable addition to fleet defense arsenals, as would be means of defending against such long-range ballistic anticarrier missiles as the SS-NX-13. Indeed, given the geometry and "terrain" of naval engagements, the great speed of many anti-ship missiles, and other factors, a zero-time-of-flight laser defense (to replicate, although more capably, such current terminal CIWS defenses as Phalanx) seems highly attractive.

Theft of Western Technology

Naturally the USSR would actively attempt to steal or otherwise obtain SDI-related technologies, especially computer-related technologies that have applications in many fields.

IV. CATEGORY II: PRIMARILY GRAND STRATEGIC STEPS

In this section, I consider strategic responses, rather than responses that involve technical innovations, changes in operational plans, or other more purely military measures.

NEGATE U.S. COST-IMPOSING/RESOURCE-DIVERTING ATTEMPTS

A major theme of much recent thinking on SDI has been that an SDI competition, unlike so many others, will be run on terms favorable to the United States. The reasons most often cited for this are our inherent lead in high-technology applications. Many people apparently believe that the United States could involve the Soviets in an arms competition that (1) the Soviets would manage less efficiently than the West; (2) would be so expensive in absolute terms that the Kremlin would be forced to divert substantial resources away from other threatening activities (such as ICBMs and power projection forces) into less threatening ones (such as ABM); and (3) would allow the United States, by virtue of many factors (especially our technological superiority), to lock the Soviets into a competitive process in which they had to spend much more than we did to neutralize or duplicate a given capability (the cost exchange notion).

In view of demonstrated Soviet concern with U.S. technological prowess, there is something to be said for all these propositions. *The situation may even be so alarming to the Soviet leadership that we could use the threat of an SDI competition to motivate the Kremlin in many ways to follow lines favorable to us.* However, we have frequently seen that the Soviets do not always do what many Western observers would consider "the reasonable thing." Indeed, the USSR's willingness to be "irrational" in this way is perhaps most conspicuously demonstrated precisely by historical Soviet behavior in the strategic defense field! Nevertheless, we should keep such factors in mind. As possible Soviet countermeasures to a U.S. plan to pursue these aims, one could list the following:

Refuse to Play

The Soviets could simply ignore SDI--or convey the impression of not being interested or impressed, just as Stalin did with the atomic bomb until he got one too. They might select this as a strategic option for several reasons. They might decide that the odds of SDI ever materializing were not high and, on that basis, strive to deny the United States any confidence that it was gaining very much by pursuing strategic defenses. (If the Soviets sincerely believed that SDI would never amount to anything, they might shrewdly attempt to convince the Americans that they greatly *feared* SDI so as to encourage wasteful spending on unproductive systems. Whether the Soviets would be capable of such a subtle scheme in these circumstances is questionable.) Or the Soviets might decide that, in view of lead times, they could afford to coast for awhile, spending money on other priorities until the time when SDI would require an active response on their part.

Yet another reason for selecting this option would be a longer-term one. The Soviets might see SDI as such a serious proposition that it would inevitably lead to a crisis at some future time. In that case, the Soviets might commit their resources into shorter-term priorities, like offensive nuclear forces and theater forces, with the expectation that they could (1) preempt conventionally or with nuclear weapons before SDI became a major factor, or (2) cope with SDI before it was fully deployed. Finally, the Soviets might opt to intensify their ongoing SDI research program.

Countervailing Burden-Imposing Threat

It might be that a Soviet response to SDI would not primarily involve strategic nuclear offensive or defensive forces and plans. Instead, they might attempt to respond in some other military arena in which they held a relative advantage. Such a response could reflect any of several factors. First, it might occur were the Soviets technologically unable or otherwise disinclined to engage the United States more directly. Or it might be adopted if the Soviets had strong doubts that SDI would ever see the light of day, yet at the same time wanted to pursue some related military objective using the "excuse" of a new arms race that had been provoked by the Americans.

Note that such a rejoinder could come simultaneously with reciprocal nuclear responses. The aim of such a countervailing initiative might very well be the imposition of such costs on the United States and its allies that an ongoing SDI would be starved for funds and therefore less able to proceed. It is probable that such a countervailing scheme would involve some aspect of the conventional balance. This would be done in order to exploit the relative Soviet advantage in many aspects of the GPF arena, as well as to exploit the opportunity raised should ballistic missile and bomber/cruise missile defenses deployed by the U.S. and USSR neutralize both sides' "extended deterrent" strategies.

Exploit Asymmetric Alternatives

In responding to SDI, the USSR can take advantage of certain asymmetries in the Soviet-American relationship either to reduce the costs of its response or to pose some kind of adverse cost-exchange situation on the United States in turn. Confining ourselves to the strategic defensive realm for a minute, several areas of relative Soviet advantage immediately come to mind. The two most obvious ones are a leadership's ability to impose both civil defenses and a draconian internal security regime on its people. Taking civil defense in its broadest meaning--to include population protection by a combination of sheltering and dispersal, industrial hardening (if not redundancy), and so on--it is apparent that the Soviet Union would enjoy a tremendous comparative advantage in its ability to emerge from a major nuclear campaign with significant percentages of leadership, military and other control, and labor forces intact, even in the face of deliberate U.S. responsive targeting strategies.

It is probably impossible, however, to generate much civil defense in the United States short of some dire set of events that persuaded the public a nuclear conflict was inevitable, *and* provided sufficient time for the country to exploit its considerable *latent* civil defense potential.¹ It is certainly possible to substitute active strategic

¹The United States enjoys a tremendous advantage when it comes to the availability of private means of transportation, food and medical

defense for civil defense, but the price of the former could very well be much higher on an equal effectiveness basis in some key scenarios. Another issue remains the permeability of a nation's borders when it comes to such surreptitious threats as bombs introduced covertly in peacetime, or weapons infiltrated by strategic *spetsnaz* outfits. The Soviet Union has an obvious advantage when it comes to border integrity and the ability to monitor activities within homeland borders.

Some other advantages may not be strictly defensive in nature. The Soviet Union may be relatively better off in an unrestrained offensive arms race the purpose of which would be to try simply to overwhelm defenses as these came on line. For example, were the USSR attempting to crank out more land-based missiles than the United States, the USSR would find itself less constrained when it came to missile siting, the ability to deploy mobile missiles, and so on.

NEGATE U.S. EXTENDED DETERRENT FORCES BY DEFENSIVE DEPLOYMENTS

Extended deterrence refers to a property of U.S. nuclear forces that enables them to discourage both a direct Soviet attack on the American homeland and Soviet aggression against especially important peripheral theaters. There was a time when the United States (and possibly the Soviets as well) believed that extended deterrence was solidly at work in many locations. Over the years, however, this putative "capability" has been more and more eroded to the point where it may now be contributing reliably only to the deterrence of a Soviet attack on Western Europe, if even there. Whatever the case, Soviet strategic defenses deployed in an alleged response to "U.S. provocation" could undermine extended deterrence, because the most likely kind of intercontinental attack that would be ordered to enhance our theater defense and deterrence prospects--a limited attack seeking some very precise operational aim and not just a demonstration strike--would be ruled out by even moderately capable widespread Soviet defensive

reserves, and so on. In the event of a crisis in which nuclear conflict seemed inevitable, research indicates that a sizable fraction of the population would devise their own civil defense plans. The crucial variable, of course, is whether time would be available to put sound plans together.

deployments. Thus the Soviets could use SDI as an excuse for carrying out a range of steps with both political and strategic objectives in mind. (Most of these would presumably concern U.S. relationships with allies and other coalition members.)

NEGATE INDEPENDENT WESTERN DETERRENTS BY DEFENSIVE DEPLOYMENTS

The Soviets have a special desire to neutralize not only the independent deterrent forces of Britain and France, but also the forces of China (not to mention so-called U.S. forward-based systems). To date, they have attempted to do this within the boundaries of the ABM Treaty. Although the Moscow ABM system would be unable to stop a determined U.S. attack, it might be somewhat more successful against an early 1980s third-party strike (or drive up the costs of any third party attacking Moscow to such an extent that the attacker would have very few weapons left over with which to accomplish other targeting aims). The Moscow ABM may also be expressly intended to prevent bolt-out-of-the-blue U.S. decapitation attacks, a threat that became more ominous to the Soviets with the deployment of the Pershing II MRBM. As the overall threat to the Soviet capital and other important targets becomes more serious with new weapons such as Pershing II and the sophisticated weapons now programmed by France and the United Kingdom (if not China), the Soviet leadership might attempt to blame SDI for an opportunistic decision to abandon the ABM Treaty, either in whole or in part.

POSE A COUNTERVAILING THREAT TO U.S. EURASIAN THEATER DEFENSE INTERESTS

Defense of our national territory against a Soviet attack is not the only nor the hardest security problem before us, of course. Defending continental theaters along the Eurasian periphery of the Soviet bloc is an extraordinarily demanding task, given the voluntary nature of our alliances and other coalitional arrangements, the proximity of the Soviet Union to many important regions, the inability of the United States and its friends to maintain a sufficient inventory of forces in all regions of interest to deal with possible threats on a high confidence basis, and the discomfiting fact that the first blow must probably be conceded to the Soviet bloc.

Since World War II, it has been the case more often than not that many have viewed nuclear weapons as a far less expensive solution to potential Soviet threats than more traditional sorts of military forces. In addition to the other reasons cited above, the Soviets may be able to put additional combat assets on line in high-priority regional theaters at a lower cost per unit than we can. If so, the Soviets may seek to compensate for a large-scale SDI program by determinedly ratcheting up the conventional threat we face in many locales. Our options in these circumstances would be either to counter that threat in kind or to seek yet another countervailing threat, probably in the form of offensive nuclear forces. The feasibility of this last option would obviously depend on a host of uncertain factors, such as the extent to which SDI provided a reliable defense of both ourselves and our allies, the degree to which the United States and Soviets had found ground for cooperation in a joint SDI scheme, and the state of the offensive and theater balances.

There are substantial historical precedents for this particular Soviet tactic. For example, at the height of U.S. superiority in central nuclear forces, the Soviets deployed both conventional and theater nuclear forces sufficient to do grave damage to forward U.S. security interests in Europe.

UNDERTAKE STEPS TO HELP ASSURE SOVIET WAR GOALS IN SPITE OF THE OUTCOME OF THE STRATEGIC BATTLE

Given an advantageous correlation of forces in forward theaters, the Soviets might be able to convince themselves that, by a combination of strategic offensive and defensive action, the gains they could make in a theater conflict would outweigh the damage the United States could inflict in a central nuclear struggle. Auxiliary steps the Soviets might pursue to reinforce this outcome could include an expanded civil defense program; strategies to hold forward targets of value hostage (thus trying to deter U.S. attacks on Soviet forces advancing in friendly territory or even on Soviet targets themselves); dramatic offensive arms reduction arrangements (including tactical and theater nuclear arms reductions) intended to reduce the simple "volume" of

damage the United States could do (and, equally important, third nuclear powers); etc. *This strategy might be especially appealing if the U.S. SDI looked to be very promising but was available only at such a high financial cost to us that we would be unable to match Soviet preparations for theater operations in kind.*

RECONFIGURE SOVIET POSTURE AND POLICY TO THREATEN DIRE GLOBAL WAR OUTCOMES

Regardless of the perceived aims of SDI, the USSR might try to negate any strategic advantages accruing to the United States by SDI and other means by indulging in particularly dastardly counterstrategies. This may be an improbable category of response, but it is nonetheless worth mention in a thorough taxonomy.

Spoil-Sport Weapons

The Soviets might attempt to acquire a "doomsday device" (very dirty or high-yield, high-fallout weapons, or the like).² Here the consequences of even minor SDI failures would be much worse than would otherwise be the case. As a last resort, the Soviets could even resort to detonating a doomsday type of device on their own territory, counting on this threat to deter the United States from capitalizing on any advantages offered by a successful SDI.

Targeting for Nuclear Winter

Similarly, the Soviets could target their forces--perhaps even against aimpoints in their homeland--to accomplish the same objective (should the "nuclear winter" hypothesis be validated).

²Exactly such a notion figures centrally in the comedy film *Dr. Strangelove*.

V. CATEGORY III: PRIMARILY POLITICAL STEPS

Finally, there are several political steps the Soviets could pursue. Presumably these would be of great importance even if it were very clear (and perhaps *especially* if it seemed very clear) that SDI would never materialize as a serious strategic or technological initiative or threat.

USE SDI AS AN ALLIANCE-BUSTING WEDGE

For a host of familiar reasons, the Soviets could persevere in their general strategy of trying to use U.S. willingness to pursue SDI as a tool for disconnecting Washington from its various friends and allies. Indeed, it is difficult to think of any American policy that would *not* be utilized in this way.

REFUSE TO PLAY IN A STRATEGIC DEFENSIVE ARMS RACE

This would simply be one declaratory component of a related military response option discussed earlier. The Soviets could act blase, perhaps, for the various reasons cited in the discussion above, although so far they have generally followed a rather opposite course.

USE DECLARATORY POLICY TO HIGHLIGHT ADVERSE MILITARY AND STRATEGIC REPERCUSSIONS OF U.S.-INDUCED BALANCE CHANGES

Threatening the U.S. public and third parties is a basic tool in the Soviet diplomatic arsenal. In the wake of President Reagan's March 1983 speech, the Kremlin wasted no time in unleashing a substantial propaganda barrage targeted primarily at third-party audiences. It is inevitable that the Soviets will continue to attempt to highlight the following points to inflame Western anxieties, especially European ones.

- SDI makes war more likely.

- SDI makes crises, when they come, potentially more volatile and dangerous.
- War, if it comes, will be much more difficult to limit and terminate, thanks to SDI.
- Third parties will pay a heavy price, because a superpower competition in strategic defenses would undermine their independent nuclear forces and place a larger conventional burden on them. Moreover, because SDI will concentrate more on longer-range nuclear forces, the United States will, according to many strategic commentators, effectively be "decoupling" itself from European defense.¹
- SDI will place just that much more of a burden on civilian economies and divert crucial R&D talent and facilities.
- SDI demonstrates the lack of U.S. interest in arms control and arms reductions.
- SDI adds a needless impetus to a generalized arms race that already involves a wide spectrum of systems and technologies.

NEGOTIATIONS AIMED AT LIMITING U.S. SDI OPTIONS

Negotiations could attempt to prohibit testing of weapons or even of certain technologies (a more difficult task, for obvious reasons). Strategic defenses may be particularly "constrainable" in a world of severe testing restrictions. Measures to prevent the defender from testing his concepts to gain confidence that sophisticated and expensive systems will work could be quite effective. By some accounts, this has already been demonstrated in the course of the continuing existence of the ABM Treaty.

Prohibitions might also be placed on the deployment of systems. However, given the threat that any breakout scenario would pose, negotiations would have to be handled very carefully. The Soviets have already proposed pertinent measures to prevent U.S. defensive

¹It is hard to imagine a defense against nuclear artillery. Thus, those U.S. friends and allies bordering the Soviet Union will be at risk, and not the United States except, perhaps, the westernmost Aleutian Islands.

deployments. SDI restrictions would probably have to be tied to ASAT restrictions. Finally, the much more difficult (and perhaps insoluble) problem of restrictions on air defenses, antisubmarine defenses, and civil defenses also might have to be brought up in some form or another.

NEGOTIATIONS AIMED AT U.S. OFFENSIVE POSTURE OPTIONS

A previous section described potentially significant synergisms between offensive forces, especially those capable of counterforce employment, and defenses, particularly less than fully adequate ones. If it found itself losing ground in other respects, the Soviet Union might seek offensive force reductions of a sort that would remove the overall U.S. potential for combined "splendid" damage-limiting attacks.

An additional important dimension to this response option concerns certain transition issues, particularly those that depend on the internal consistency of the Strategic Defense Initiative. President Reagan's avowed objective in launching the initiative in the first place was to rid the world of the nuclear bugbear forever. Critics have pointed out, however, that this objective was announced even as a major U.S. offensive force buildup was underway and as limited progress was being made at the START talks. Undeniably there are profound difficulties attendant upon any effort to effect a transition to a so-called "defense dominated" (let alone a nuclear-free) world. One obviously cannot achieve this transition overnight, so it is not self-evident that the birth of SDI is substantially inconsistent with an offensive modernization program. Nonetheless, the Soviets may be able at some future date to exploit this apparent inconsistency for political gain.

EXPLOIT POLITICAL ASYMMETRIES THAT CALL SDI FEASIBILITY INTO QUESTION

This is simply the political side of an analogous military-technical response option cited above. By demonstrating contrary results in tangible ways (such as staged operational tests of their own), the Soviets may attempt to reduce the probability that SDI will be regarded by Western populations as a feasible endeavor. As before, of course, the Soviets will have to bear in mind that pushing this line too hard could cause them more harm than good over the long run.

AMPLIFY THE DESTABILIZING ASPECTS OF SDI TO GENERATE POPULAR ANXIETY AND OPPOSITION TO DEPLOYMENT

All too often, the American defense establishment is chided for its inability to sustain a given defense initiative over a long period of time. Some programs, such as the U.S. strategic defensive program of the mid- and late-1960s, expired from a lack of adequate political support. Others, like the strategic offensive program in the early and mid-1970s or the buildup of NATO-oriented forces in the mid-1960s and again a decade later, have suffered from tremendously adverse funding developments, notably the diversion of resources to the Vietnam war. In many cases, management and acquisition planning failures are the dominant causes (Army air defense programs consistently fall into this category). Sometimes diplomatic pitfalls cannot be avoided (recall the neutron bomb controversy). And very often, the combination of reach exceeding technological grasp and inability to keep programs flexible in the face of a changing threat sentences once-popular programs (such as the B-70) to oblivion.

In short, many Soviet planners might not consider it overly risky to bet against a program as expensive, controversial, and complex as SDI. Moreover, the Soviets are well aware that they can do much to increase the odds that an American program will founder. Perhaps the greatest vulnerability of a given U.S. defense program results from the invariable fragility of the domestic consensus on defense policy. Defense costs a lot of money, creates social problems, raises the risk of war in many popular perceptions, and so on.

By stressing the provocative, threatening, and costly nature of any SDI program, then, the Soviets can increase the probability that the electorate in many nations, including the United States, will view SDI as being worth neither the costs nor the dangers. Some domestic risks of this strategy, however, must also be noted. In trying to inspire Western opposition, the Soviets run the risk of losing credibility and generating more skepticism than opposition or, even worse, creating so much anxiety (and perhaps indignation) that they actually contribute to popular support for the defense program.

BE MORE WILLING THAN THE UNITED STATES TO ABSORB PAIN

Perhaps the most important but least answerable question in the long run is whether the Kremlin, faced with a situation in which a fundamental goal, such as basic survival of the Soviet regime, were seen to be in jeopardy, would simply choose to disregard certain imbalances existing in a given military sphere. Even a powerful in-place American SDI force might not appear to be an insurmountable barrier should worse come to worst. Now there is a great debate on what Soviet attitudes in such a situation might be. Some have argued that, based on the historical record, the Soviet leadership would find even a substantial population loss and various post-attack imbalances to be tolerable if the alternative were political annihilations. Others, using the same evidence, note that the Soviets are highly sensitive to the extreme damage a major war might bring and therefore will be highly likely to work to head off catastrophe. Being willing to bite the bullet may not be a sensible strategy in American eyes, but it is included as an option here for the sake of completeness.

VI. CONCLUDING REMARKS

The preceding discussion has attempted to provide a comprehensive and organized inventory of possible Soviet responses to a reasonably thorough and determined U.S. strategic homeland defense initiative, the full scope of which is itself, of course, not very well defined at the present time. Presumably, the net Soviet response to a U.S. comprehensive strategic defense initiative (or a more specific SDI, as that term is currently widely used in the United States) could be characterized in terms of the options in this catalog that are pursued (along with data on the degree to which they are adopted, and their schedule for adoption); the options the Soviets retain by some lower-level hedging; threatened or deceptively present counter-options displayed; and options forgone. Naturally, it is difficult at the present time to offer any kind of rigorous defense of any given package of Soviet responses for several reasons:

- It is not yet clear what can be discerned as "new" or reactive with respect to Soviet counters to SDI, in the sense that some given activity has become distinctly perceptible as a significant departure from Soviet aims and enterprises already in place before 23 March 1983.
- At any given point in time, it may be hard to discriminate some tangible programmatic and policy responses from rhetoric, programmatic "chaff," and so on.
- Designating a credible list of likely responses to a major U.S. program the scope, schedule, and ultimate aims of which are not now completely defined is a problematic endeavor.
- Crucial data regarding especially programs, tactics, and operational changes contemplated as responses to SDI may not be available in sufficient quantity and quality even looking beyond the strict near-term planning horizon.

Nonetheless, certain "concluding observations" about the foregoing inventory can be made, and our historical body of knowledge about the Soviet defense policy process can be exploited after a review of key background issues to yield some initial propositions for further research. If this catalog assists such assessment by providing a check list of necessary issues for more detailed investigation, it will have provided its task.

About the paths future assessments may follow, certain generalized propositions are suggested by the type of option inventorying process that has just been completed.

First, that we will at some point probably see all three kinds of Soviet responses, and, if they are not implemented by a certain point in time, we should see indications of preparations for their ultimate use. Of course, estimating the likelihood of different generic types of Soviet responses is a difficult and uncertain matter. However, as a first cut estimate, several more specific conclusions are fairly self-evident. The most durable, earliest employed, and most decisively and consistently configured Soviet responses will be political. Further, predicting Soviet grand strategic responses will inevitably depend on some larger-scale estimates about the future nature of both U.S. and Soviet offensive capabilities, Soviet defensive technological potential, and the like: They are therefore inherently more uncertain, but taking into account past Soviet practice, the major policies selected by the USSR will probably fall into some section or another of this taxonomy.

The most uncertain parts of the total Soviet menu include the operationalized versions of the various tactical, technological, and related response options described here: The Soviet counteraction to any given SDI depends explicitly on the nature of the proposed U.S. defense system, as well as upon certain complex determinations of the risks of introducing a certain line of Soviet action. Naturally, in many cases, the inputs to such assessments remain to be seen. Moreover, there are probably too many possible credible cases and too many permutations of various options and sub-options to exhaustively treat every case worthy of a close look.

Second, it is likely that the Soviet response--consisting of a triad of political, grand strategic, and military-technical options--will be internally consistent compared with other military cases. In other words, the components of an overall Soviet response will be mutually supporting and will seek coherent goals. Probably the main reasons for assuming a high degree of coherence in the overall Soviet counter-program to the SDI are the very long lead times of many crucial U.S. defensive technologies and systems, and the great Soviet familiarity and concern with the general nuclear deterrence question, the matter of homeland defense, a perceived opportunity to use various questions raised by SDI to promote concerns and uncertainties among key allies of the United States, and Soviet anxieties about American technological prowess. In short, it would not be surprising to encounter an unusually well-integrated Soviet SDI response initiative.

Third, political aims will probably be the most influential and probable determinant of other developments. Depending on resource availability and the menu of possible technological choices, short term technical and even strategic options may be laid out independently of such deliberations, but their implementation or authorization (in the case of tactics, changes in operational concepts, etc.) can be required to be consistent with overall national political goals before the need to make basic decisions about the specific forms counter-SDI programming and other options will take.

Fourth, research constraints undoubtedly will influence Soviet responses, although the degree to which this is so remains to be characterized analytically. Similarly, both sides will be interested in the resource allocation aspects of a competition initiated by a certain level or mix of U.S. SDI work. This will especially be the case if the United States sets out the issue of an offense-defense cost-exchange ratio or competition as a planning basis for its own SDI preparations.

Fifth, many troubling uncertainties will remain regardless of the state of our knowledge about the overall Soviet response to SDI and its subordinate specifics. For one rather disturbing case in point, various surreptitious and clandestine response options may be nonassessable even with a major U.S. data collection and analysis effort.

Sixth, even a highly coherent Soviet response menu will contain many branch points and many components or choices within each specific reactive scenario. Some of the specific and collective responses may have multiple purposes and roles within a largely SDI-related competition and possibly in other national security regimes. In fact, some of these may be so applicable in other areas of the broader U.S.-Soviet competition that they might be pursued even with a waning of the initial SDI challenge.

This Note has listed a set of hypothetical Soviet responses to an as-yet undetermined U.S. SDI development and deployment scheme (and, looking beyond the specifics of that, larger comprehensive strategic defensive effort). Accurately identifying the most important possible Soviet reactive effort must depend to a large extent on future developments. Casting the options within the terms of the dual functional/structural taxonomy used here can, however, be of assistance in attempts to devise a framework for more specific analysis of particular Soviet technological, military, strategic, and political response options. But even once more data are collected, more details about SDI firmed up, and more analysis of various types done, substantial uncertainties will remain regarding specific Soviet options and in the mechanisms by which categories of options might be tailored.

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